

Claim 2

The method of prospecting and mining 'in situ' ~~the~~ gas hydrates of claim 1, for production of natural gas -from ~~solid~~ solid gas hydrates- based on underwater electrical explosions, caused by electric short circuiting at the bottom of the see, where the solid gas hydrates usually are found; and the underwater electric explosions are made inside of -frog man's like- bells, to cause simultaneous liberation and collection of the natural gas from the gas hydrates (sometime containing also hydrogen sulphide) and sent that gas to the exploring platform trough suitable hose, of large size cross section;

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Claim 3

The non polluting process of Claim 1 used for production of pure, not expensive and non explosive (quieted) hydrogen and by-produced pure oxygen, obtained from natural gas and from the very polluting hydrogensulphide, doing that without emission of pollutants, carcinogens and even CO₂, where for the purpose all natural gas and hydrogensulphide are combusted as fuel to generate steam for a hyper efficient bezentropic POWER PLANT, to produce inexpensive electricity performing the combustion, in fluidized bed, and in the presence limestone gravel; thus, converting the sulfur of the hydrogensulphide to the absolutely neutral and valuable gypsum -used concurrently for fertilizers, as soil stabilizer and for masonry- thus, beside electricity is obtained only a blend of nitrogen, noble gases and CO₂ where the carbon dioxide is separated and then, ~~separated and~~ piped to the see, while to the remained (from the combustion) nitrogen is added ^{by} 4% to 40% ^{to the} hydrogen (depending on the particular need), obtaining that way a QUIET (not anymore explosive) hydrogen-nitroged blend, safe and suitable for use in home heating, industrial applications, in the chemical synthesis and as well as REDOX FUEL for the batteries of the electric cars and for other (special) transpotration vehicles using the hydrogen as direct fuel. where that pure hydrogen is derived through electrolysis of the water using said very inexpensive electricity derived from the bezentropic power plant of the invention, where that way is by-produced also pure oxygen as another valuable product of this remarkable eco process of processes;

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Claim 4

That novel part of Claim 1 used for manufacturing of ACTEAL FUELS and SOLVENTS out of natural gas, via catalytic partial oxidation of the natural gas and of the similar gas and light hydrocarbons, obtained from my FUEL ALLOYS, performed with insufficient oxygen, or air, at temperatures of 450°C ± 25°C in water cooled tubular reactor and in the presence of 99.999% pure electrolytic copper as catalyst, in the form of wire or granules, obtaining that way a master intermediary mixture of lower aldehydes, alcohols and trace

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amounts of ketones, which when cooled down to about 60°C is transferred into another water cooled reactor and there, in the presence of another catalyst, is converted to an excellent "bouquet" of acetals, which acetals do not need to be separated one from the other because, that mixture is excellent "as is" ecological fuel for cars without any changes upon the vehicles and as eco solvents; where said special second catalyst is the plurality of acidic ion exchange resins and of natural and synthetic zeolites doped with CaCl_2 and furthermore, because said master mixture contains twice as much as aldehydes than the necessary quantity to combine them with the alcohols, to produce the acetals, the remained excess of aldehydes are passed, at room temperature and atmospheric pressure, through the synthetic zeolite catalyst ZM-5 which converts the aldehydes to lower hydrocarbons such as pentane, iso-pentane and hexane which is aviation kind of low polluting gasoline, convertible ^{to} non polluting (except the CO_2) fuel blend by blending that gasoline with acetals, for which blending the acetals are distilled to remove from them part of the water in order to have stable fuel mixture,

Claim 5

The catalysts of Claim 1 ——— when they are used to manufacture acetal fuels and solvents and for direct synthesis of gasoline from the aldehydes;

Claim 6

The electric underground explosions, and the "frog nen's tipe of bells" of claim 1 used: for discovering and mining of gas hydrates, for other clathrate compounds and for geological and geophysical prospections;

Claim 7

The PLURALITY of the BEZENTROPIC POWER PLANTS of Claim 1, without which this invention is impossible, since it cannot afford otherwise economical feasibility, where the members of said plurality are specifically identified in Claim 1 as: g-2; g-3; g-4; g-5; g-6; and g-7,

Claim 8

The bladeless bezentropic stators and rotors of the plurality of the bezentropic turbines and compressors, of Claim 1, using instead of the classic turbine blades, cylindrical shaped stator, housing a reel shaped rotor having 2 or more evolvently coiled flat spiral canals, of parallelogram shaped cross sections; the hereby claimed variable flat convergent-divergent nozzles of claim 1, contained ^{also} in Claim 7, and also the ^{Modified} classic nozzle ⁰⁶⁻⁰⁶⁻⁰³ ^{V. Shing} of laval, ⁰⁶⁻⁰⁶⁻⁰³ ^{V. Shing} used and rediscovered — as a bezentropic device;

Claim 9

My modified vortex tube of Claim 1, invented and — described — for

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member g-5 of the plurality of the bezentropic turbines, using -differently from the classic vortex tube of George Ranque- a better bezentropic compressor, a flat convergent-divergen nozzle for preliminary supersonic acceleration of the air into a flat jet (instead of direct connection of the compressor with the vortex tube by a simple hose) and a large spiral chamber facilitating the needed fast spinning (rotation) of said flat jet (instead of the cylindrical chamber of the classic vortex tube)

Claim 10

The vortex propulsion system of Cliam 1 of this invention, described as member g-6 of the plurality of the bezentropic turbunes there, replacing the classic jet propulsion (since is very inefficient system) exhausting in the atmosphere enormous, not well used, LINEAR KINETIC ENERGY; the only way to avoid that ^{being} abandoning the classic jet propulsion and replacing it by the hereby claimed VORTEX (rotay) PROPULSION SYSTEM working by propelling the aircraft by ROTARY KINETIC ENERGY OF THE WORKING GASES, CREATING THRUST -BY ROTARY PUSH- UPON THE INTERNAL SURFACE OF A FUNNEL LIKE PROPULSION NOZZLE HAVING SUFFICIENT LENGTH TO CONSUME ALL ROTARY ENERGY BY THE TIME OF THE EXHAUST OF THE GASES IN THE ATMOSPHERE AND EXHAUST THERE ONLY INSIGNIFICANT AMOUNT OF LINEAR KINETIC ENERGY, all requiring large ratio between the VORTEX and the LINEAR kinetic energy of the gases, serving a given length of that conical nozzle, capable to work both with ionic, or non ionic fuels; where as non polluting fuel is used NASCENT HYDROGEN obtained conveniently by heat cracking -at temperature of over 600°C, or through electric arc- ammonia and ammonium nitrate, claimed hereby also as efficient IONIC FUEL, since the nascent (atomic, ionic) hydrogen needs about 30 seconds to recombines into molecular hydrogen which is more than the necessary time to be used 'in situ' as ionic fuel -for jet propulsion- all working as follows:

a powerful bezentropic compressor, driven by a bezentropic gas (hydrogen) turbine, is supplying the system with the air needed both for the combustion process of the turbine and for the vortex propulsion part of the system, where both subsystems are using as fuel nascent hydrogen -blended with atomic nitrogen, coming from the cracking of the ammonia- for which the vortex subsystem has separate combustion chamber connected with the spiral chamber of the vortex funnel through my flat convrgent-divergent nozzle of Clain 1 to further increase the velocity of the flat jet there to supersonic velocity, and to avoid extreme lengths of the vortex propulsion funnel, the vortex caused by the spiral chamber of the funnel is further rotary accelerated by an electromagnetic rotary field of same kind that is used within the induction motors -but, by much higher angular velocity- fixed around the funnel, next to its spiral chamber, where the efficiency of the system is

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additionally increased by funnel's concurrent spontaneous sucking and vortex accelerating of atmospheric air; and the same vortex propulsion can be used also for very efficient space travels, assuming that as oxidizer of the combustion is used a tank filled up with oxygen and the construction of such system is entirely made out of titanium and aluminum alloys;

Claim 11

The special synchronization system of the plurality of the bezentropic power plants of Claim 1 without which they cannot be connected to the cities electric system for parallel work, consisting of small synchronous servo motor connected to a city's electric system and diving, independently from the axle of the bezentropic turbine, but at same RPM of the turbine a plastic ring having a series of about 7 photo diodes one next to the other, all facing an inner plastic ring, having a Light Emitting Diode (LID) facing said series of photo diodes (PhD), which inner ring is connected to the axle-tree of the turbine and rotates exactly by its RPM; then, when both rings rotate with one and same RPM the light of the LID facing -in these condition- the sentral PhD sent a signal for that fact, which signal is then amplified and sent to the solenoid monitoring the fuel valve of the turbine "telling" the solenoid to keep steady its position because the RPM of the turbine is locked to the city electrical system; alternatively, when the phase of that locking is changed, the other PhD send signals to the same solenoid to correct the error by a new and adequate position of the fuel valve,

Claim 12

The bezentropic extraction of energy from the Brownian movements of the electrons within the metals and the superconductors of Claim 1, adding strong permanent magnetic field to the transformers to cause the disordered Brownian motion inside of their coils ~~rectified~~ into one and same direction, thus, to create from that rectifying electric current from the Brownian motion which is readily pronounced when the coils are made out of SUPER CONDUCTORS, and when they are not, then to the coils should be connected a rechargeable battery in series of the polarity of the rectified Brownian current which is adding to the battery additional electric energy,

Claim 13

The ELLIPTIC bezentropic compressor, needed whenever the bezentropic turbines of Claim 1 and Claim 7, are of small diameters, for in such conditions, turbo compressors of small diameter cannot develop sufficiently high compression -without prohibitive high RPM.

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